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ABSTRACT

This speech addresses the impact of schools on teaching and learning, and explains the need to evaluate the following three influences of physical school settings: health and safety factors; ambient environmental factors; and curriculum-based environmental factors. Also addressed are the influences of school and classroom size, and the need for the school setting to be appropriate for the types of learning activities taking place. Concluding comments highlight the link between literacy, play, and the physical environment. A student user rating scale to evaluate classrooms is included. (GR)

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Reading a School Building Like a Book: The Influence of the Physical School Setting on Learning and Literacy

Paper presented at the Program for Research and Evaluation of Public Schools (PREPS) Conference, Jackson, Mississippi, January 28, 1999.

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Introduction

The condition of school buildings is now on our national agenda. The problems connected with the physical infrastructure of our schools has been well documented: AASA has their Schoolhouse in the Red, GAO has their various reports on the Condition of America's Schools, and ASBO has their Excellence in Facilities Initiative. We even have the National Clearinghouse for Educational Facilities operated by the Department of Education in D.C. Al Gore has placed the topic of school buildings on his agenda for re-election.

In Mississippi, the Adequate Education Act of 1997 provided resources to modernize and add classrooms in just about every district in the state. Our Institute has been formed to support these and other educational design efforts in the State.

Now that we're talking about school buildings, its time to think differently about our school buildings.

First, schools are much more than bricks and mortar – they are symbols of our commitment to education. As Jonathan Kozol stated in his book Savage Inequalities, "the point is that all the school reforms on earth are worthless if kids have to come to school in buildings that destroy their spirits".

Second, physical settings can motivate us or discourage us. Sara Crumpacker from University of Virginia has written: "Think of the school of your youth: was there a favorite tree outside a classroom window that you watched drop its leaves and stand bare-headed all winter, only to be born again in spring's glorious bloom? -- Perhaps you can recall the tantalizing sound of glass milk bottles clanking against wire crates as snacks were being delivered -- the secret place behind the hall fire extinguisher where you wrote your name? -- If places have such lasting effects on people's lives, then it makes sense that those places in which we spend time should be designed expressly for us -- In schools this means designs that inspire good teaching, support productive learning, enhance people's joy, and prompt feelings of security.

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Finally, school buildings are more than bricks and mortar, and they are more than a container for teaching and learning -- the physical setting in which learning takes place impacts how we teach, how we learn and how we feel about ourselves and others.

The physical environment of our schools does affect learning and behavior. Part of what I am going to talk about today has to do with providing some evidence for you to consider.

Developmental needs and curricular goals are seldom used by educators and architects in determining the design of learning environments.

We know that the learner's surroundings affect...
- perceptual learning
- concept formation
- language development
- socialization
- creative-aesthetic growth
- attitudes toward school
- reduction of vandalism, and
- attrition rates in schools.

In looking theoretically at the physical setting of the school, we can organize factors into three basic categories:
1. Health and Safety Factors
2. Ambient Environmental Factors
3. Curriculum-based Environmental Factors

With health and safety we are primarily concerned with cleanliness, accessibility, material safety, egress, fire, security and vandalism. This is the probably the most important, but least controversial -- The Mississippi Adequate Education Act was designed to support the adequate provision of health and safety factors. The absence of health and safety measures can limit access for the disabled, lead to sickness -- and accidents – all indirectly influencing student performance.

What can we do? These problems can be monitored through regular audits that are apart of an on-going facility management process in existing buildings -- In new buildings we need to ensure compliance with codes as well as designing for the future maintenance of the school building in mind whenever possible.

The ambient environment is a second group of factors that can effect learning. The ambient environment includes such factors as air circulation and quality, thermal conditions, lighting and acoustic quality. Most of these factors are very familiar issues to educators -- but they are still neglected in many cases. With air quality problems arise respiratory illnesses (caused by SBS or sick building syndrome) -- Students can experience fatigue, eye strain, blurry vision, headaches all due to poor indoor lighting.

These effects on physiology can have direct effects on students' ability to mentally concentrate on learning tasks.

What can or should we do? Many of these problems can be handled through increasing outside air intake, economizer cycles, and operable windows -- (what Vivian Loftness of the Center for Building Performance at Carnegie Mellon University has called "fresh-air architecture"). To deal with lighting quality -- many manufacturers now offer full-spectrum fluorescent lighting -- In addition, increasing natural daylighting and light controls, dimmers and task lighting can improve lighting quality as well.

Finally, our third and final set of factors to consider: Curriculum-based environmental factors. I am going to focus the remainder of my presentation on these factors.

Curriculum-based environmental factors that influence learning include classroom design, arrangements and adaptability, facility size, and the design of places for learning. This category of factors is probably the most controversial and often ignored and misunderstood by educators and public alike -- Yet, curriculum-based factors holds the greatest promise and payback for learning. I'd like to conceptually group a number of variables that have been researched in the past 10 years into what I would call the ISSUE OF SIZE…

I'll start with school size – then discuss class size – and finally link to these variables the learning center (or activity pocket) – which represents the immediate space around the student actively engaged in a learning activity.

Small Schools

We know that small schools offer students…
- greater opportunities to participate in extracurricular activities
- greater opportunities to exercise leadership roles.
- student satisfaction increases
- as does the number of classes taken
- community employment increases
- In addition, there is a lower incidence of crime
- And there is less serious student misconduct,
- Discipline in school is higher,
- students take more responsibility,
- students are more satisfied with school
- and they have a more positive self-image.

All these factors can influence learning. Finding ways to decrease the size of schools and classrooms is a difficult but important task ahead of us.

Of interest to this group, William Fowler reported that the effects of school size at the elementary level show that…

- there is a negative relationship between math and verbal test scores and elementary school size
- and smaller elementary schools are particularly beneficial to African American students' achievement.

Small Class Size

The Tennessee STAR Project for instance found that students in smaller K-3rd Grade classes (small being between 13-17, and large being between 22-25) showed a 15% improvement on reading and math scores over their peers in larger classes. Keep in mind this study was correlational not causal – But it has had, along with other confirming studies, a positive effect on federal policy.

Other studies have begun to advance some explanations for the value of small class sizes and student performance:
- student attitudes increase
- voluntary participation increase in small classrooms
- teachers have more interactions with each student
- teachers can provide a rich and vastly differing array of interactions
- teachers can implement learning centers
- student learning teams, peer tutorials are possible
- students have increased attention
- and less social withdrawal found than in larger classrooms.

Learning Centers

Learning centers - this is an area of research that has not received much attention, but is one that I find many educators are interested in. My colleague Gary T. Moore, an expert in childcare facilities, first developed the descriptive name of the "resource-rich activity pocket". First, we know that settings need to be appropriate for the types of learning activities taking place – this is why we have general classrooms, science labs, computer hubs and small group learning spaces. To support the appropriateness argument – we know from our research that well-defined learning centers can encourage task-oriented behaviors.

New buildings should be designed for variety of learner groupings: individual, one-on-one, conferencing, small cooperative groups, large group instruction. In addition, the school building can and should be used as a community gathering place acting as a catalyst for structured learning activities beyond the classroom instruction.

With respect to literacy:
- we know that literacy develops in meaningful, functional social settings
- Literacy development involves a child's active engagement alone, and
- in cooperation and collaboration with peers
- builds on what the child already knows and,

- needs the support and guidance of more literate individuals.

The research suggests there is a strong link between literacy, play and the physical environment. (Typically, teachers perceive play as a means of developing social and motor skills, not promoting literacy.) Studies have demonstrated links between the types of play and elements of literacy development. Dramatic play for instance improves story comprehension and production, by helping children better understand story structure. What follows is improved recall and production of story narratives by children.

The physical environment also plays a critical role in the classroom learning experiences of young children.

The study done by G.T. Moore found that partitioning of a classroom – into what he called well-defined, resource rich activity pockets – what we might call "well-designed learning centers" – will…

- facilitate both peer and verbal interaction as well as,
- fantasy, associative and cooperative play.
- In addition, appropriate physical classroom arrangements encourage children to explore, interact, cooperate, read and speak more.

Other researchers have discovered that including reading and writing materials in dramatic play areas can stimulate voluntary literacy behaviors.

So we know this? What do we do with this knowledge?

Concluding Remarks

For decades, educational leaders have focused on the components of a successful educational program -- yet they have regarded the physical setting as an institutional backdrop deserving little attention. Widespread misconceptions reinforce the view that the quality of a school building has no impact on academic performance -- As a result, a gap exists between the educators' view of improving quality and the process of planning and managing schools.

I'd like to end this presentation by trying to answer the following question: What are some practical things you can do when you walk into your school building tomorrow or next week?

I'm not going to give you a cookbook checklist – that would be dishonest and you will only file it under miscellaneous.

Since many educators are not accustomed to thinking about their physical environments as an active medium contributing to learning behaviors -- it might be useful to spend some time in your school and classroom in critical observation of the quality and quantity of learning behaviors taking place there.